



DIGITAL PRINCIPLES INTO PRACTICE

APRIL 2018

ACKNOWLEDGEMENTS

The **Human Development Innovation Fund (HDIF)** is a £40m United Kingdom Department for International Development (DFID) innovation programme in Tanzania managed by a Palladium-led consortium with KPMG, Newcastle University (EG West Centre), Loughborough University (WEDC), and the Institute of Development Studies (IDS).

With a focus on innovations from non-state actors and the effective utilisation of information and communication technologies for development (ICT4D), HDIF seeks to accelerate the experimentation, commercialisation, and diffusion of innovations in health, education, and water, sanitation and hygiene (WASH). Further details can be obtained at www.hdif-tz.org.

The **Commission for Science and Technology (COSTECH)** is the government partner to HDIF and a key strategic partner for the project. HDIF and COSTECH work together to realise a shared goal: to accelerate innovation and effective use of technology to increase and improve opportunities for health, education and WASH in Tanzania. Further details can be obtained at www.costech.co.tz.

The **UK Department for International Development (DFID)** leads the UK's global efforts to end extreme poverty. It is tackling development challenges in Tanzania through a portfolio of investments including HDIF. Through its Digital Strategy, DFID has articulated its commitment to embedding the Principles for Digital Development¹ into its programmes. All suppliers and contractors are expected to adhere to the principles.

The authors would like to thank DFID, COSTECH, and the following grantees and partners that contributed to this White Paper: Amref, Camfed, Catholic Relief Services (CRS), Digital Opportunity Trust (DOT), Fundación Paraguaya, Shule Direct and Ubongo.

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All photos HDIF Tanzania unless otherwise specified. First published in October 2017.

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Front cover: Girls learning digital literacy skills at Buni Hub in Dar es Salaam.

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FOREWORD

I am a true believer in the power of digital technologies to drive social impact. Digital solutions can, in part, extend basic services to new users and communities, improve service provision, and develop new and more efficient markets. However, some of the most vivid experiences I've had in international development have been seeing secondary school classrooms littered with a decade of dust-laden hardware stacked floor to ceiling – the remnants of the grand visions of technology project after project dropping in a digital training with a sprinkle of equipment, low buy-in or sense of ownership from key stakeholders, and limited sustainability planning. And I've seen hosts of unscrupulous or unaware actors looking to benefit from access to private information, or community access that offends basic development principles.

At the same time, digitally focused social networks and start-ups are popping up across Tanzania. WhatsApp groups of programmers are reaching the group membership maximums. Many young people are starting up businesses around drone technologies on the mainland and Zanzibar. Technology hubs have been coming onto the scene – and will continue to do so. And tested digital businesses like SmartCodes and Max Malipo have proven that technology businesses can succeed in Tanzania at scale.

Now, in part, I'm a funder of innovation and technology at a time when new technologies are coming on board every day and our international development community has years of learning opportunities from various information and communication technologies for development (ICT4D) projects.

At HDIF, we want to share learning from our own experience to assist players in ICT4D to ensure we are not creating



Children learning with Mwabu's interactive tablet at Silverleaf Academy, Arusha.

more stacks of unused hardware and limited viability which combine to create a larger wasteland of well-intended development projects. A broad set of donors and partners have combined to develop the Principles for Digital Development, which form a simple set of values that have helped HDIF understand our impact and establish whether we are setting partners on the best path for success.

This White Paper is HDIF's first formal publication sharing our initial insights and learning around the application of the Principles for Digital Development in Tanzania. We hope our learning will provide practice insights for the ICT4D community in Tanzania and abroad. By applying

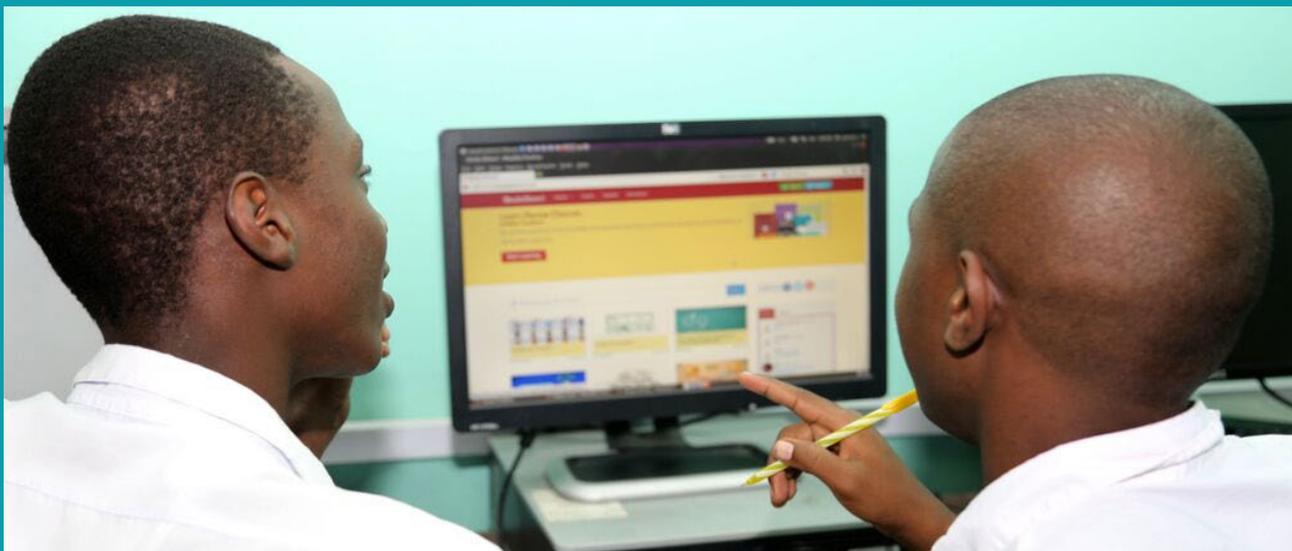
the principles to our work, we and our partners can assess their validity through 'learning by doing' and anticipate the challenges in scaling our innovations.

We welcome your comments and feedback to help us shape our learning and approach and will continually incorporate lessons from grantees' work and the ecosystem overall. Finally, I would like to personally thank the HDIF staff, grantees, partners and technical advisers for their efforts to design and deliver these insights.

David B McGinty

Director, Social Innovation + Technology, Palladium Group

INTRODUCTION



Teachers and students can use Shule Direct's web portal to access localized digital learning resources.

In recent decades the global growth of digital technologies has transformed the lives of many people. Of the 3.2 billion people using the internet globally, two billion are from developing countries.² Among the poorest 20% of households, nearly seven out of ten have a mobile phone.³ If harnessed and used in the right way, digital innovations have the power to accelerate human development and bring improvements to the lives of poor people and the hard to reach. Digital technology is the force behind countless new frontier technologies that can increase people's access to services, increase the flow of information and finances including to remote locations, and strengthen the opportunities of millions of people to learn, remain healthy, and secure livelihoods.

Technology is seen to be essential for achieving the Sustainable Development Goals (SDGs).⁴ But while the coupling of innovation with digital technology presents

unprecedented possibilities for human development, the phenomenon also has a problematic side. The United Nations Commission on Science and Technology for Development (UNCSTD) points to the negative impact that digital technology in development can bring.⁵ Contrary to opening up the world for all, there is a risk that access to new technology and connectivity will exacerbate inequalities across countries and people that have greater wealth, from those with less. These imbalances can further marginalise women and other vulnerable groups. The World Bank 2016 report *Digital Dividends* warns that without a supportive enabling environment, including appropriate education and governance structures, negative consequences of new digital technologies can include the concentration of market power, greater inequality and excessive government control.⁶

Principles for Digital Development

Recognising both the risk and the opportunity that digital technology presents for development, individuals, development organisations and donors began exploring how best to surface and spread best practice in the use of information and communication technology (ICT) tools. These discussions culminated in the Principles for Digital Development, a common set of ground rules that aim to institutionalise the many hard lessons learned in the use of information and communication technologies in development (ICT4D) projects. The nine principles can be adopted by anyone using digital as a means of delivering development outcomes and are intended to serve as guidance rather than edict. They are meant to be updated and refined over time. The nine principles are as follows:

- Design with the user
- Understand the existing ecosystem
- Design for scale
- Build for sustainability
- Be data driven
- Use open standards, open data, open source and open innovation
- Reuse and improve
- Address privacy and security
- Be collaborative⁷

In its 2018-20 Digital Strategy,⁸ DFID sets out its commitment to doing development in a digital world and to transforming as a government department. The strategy outlines how DFID requires its partners to embed the Principles for Digital Development into its programmes so that they reach marginalised people faster to ensure they are not left further behind by digital transformation.

HDIF aims to contribute to the global dialogue on the principles through the Digital Impact Alliance (DIAL), the stewards of the digital principles, who facilitate lesson-sharing around digital development and promote their adoption globally. The HDIF digital framework for learning borrows from DIAL's materials and content. For more information see <https://digitalimpactalliance.org/>.

The digital and innovation landscape in Tanzania

Tanzania has risen from position 123 (in 2014) to position 96 in the 2017 Global Innovation Index (GII), putting it ahead of many other sub-Saharan African countries, signalling the potential for the adoption of new technologies and associated growth opportunities. Tanzania's Development Vision 2025 recognises that ICT is central to a competitive social and economic transformation. It states that *"These technologies are a major driving force for the realization of the Vision. They should be harnessed persistently in all sectors of the economy..."*

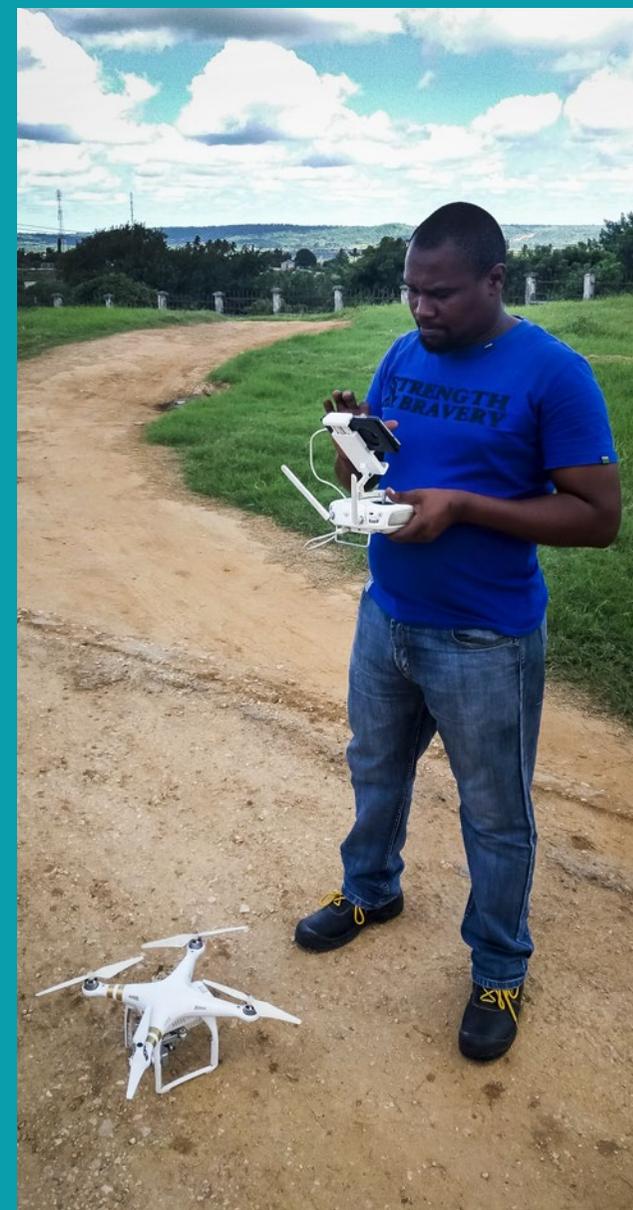
The government of Tanzania approved the renewed National ICT policy in 2016, building on the Vision 2025. Simultaneously with the ICT policy, a national science, technology and innovation policy has been in preparation, although it has not yet been passed.

A national ICT Commission was set up by Presidential Decree in 2015 that is responsible for coordinating and facilitating ICT policy implementation in the country.⁹

The Tanzanian ICT sector is strongly driven by mobile phones. According to the Groupe Spéciale Mobile Association (GSMA), by the end of 2015 just over 70% of Tanzania's population were connected to a mobile network, while the Tanzania Communications Regulatory Authority (TCRA) suggests that this figure may have risen to as high as 80% by 2016.¹⁰ Tanzania, and especially Dar es Salaam, has a relatively lively start-up scene, with innovation spaces, hubs and business incubators to support and catalyse it. However, there is as yet little funding available for start-ups at the present time, no visible local investor network, and no longer-term source of funding for local start-ups. Many key players in the Tanzanian innovation ecosystem are included on HDIF's Innovation Ecosystem map, which currently shows 22 hubs and six incubators in Tanzania.¹¹ The map is a live document and new entries are continuously added. It can be viewed at www.innovate.co.tz.

HDIF as a learning platform for innovation and scaling of digital technology

HDIF's Digital Approach sets out actionable steps for using the Principles for Digital Development to support cross-sector technology adoption and scaling-up for innovation-related practitioners (including HDIF and its partners) and policymakers in Tanzania. The prevalence of digital innovations in the HDIF portfolio presents an opportunity to generate learning from grantees who are putting the principles into practice in a Tanzanian context.



Drone technology is being tested by users and new services are being built around the possibilities they bring to Tanzania.

DAVID MCGINTY

The Principles for Digital Development were a natural choice to be used as the learning framework through which the digital elements of HDIF grantee projects could be examined. Of HDIF's 36 current grantees, 21 (60%) leverage ICTs, including mobile technologies, to address development challenges in Tanzania. For example, HDIF's education portfolio includes various digital solutions such as tablets and e-readers that are enriching students' learning experience in secondary schools, and testing technologies from a range of education partners including Worldreader, iSchool, Intel Learn, Google Classroom and Eneza Education. In water, sanitation and hygiene (WASH) innovative water systems are bringing clean, accessible water to communities using technology provided by Grundfos and Susteq. And in health, innovative healthcare applications are improving mother-baby pair tracking across the continuum of care, are improving maternal, newborn and child health through SMS-based health

education,¹² and are harnessing technologies from a range of organisations including Dimagi, Vecna, Mezzanine, GE and Frontline SMS.

The Commission for Science and Technology (COSTECH) is a key strategic partner for HDIF, working to accelerate innovation and translate research into policy and practice. This partnership provides HDIF with an opportunity to expand its sphere of influence in the Tanzanian ecosystem among partners, ministers and policymakers. In addition, HDIF works directly and indirectly with key digital development partners and stakeholders across sectors, including the Development Partners Group for Innovation & Technology and the mobile health Community of Practice, and with hubs and incubators such as Buni Hub, DTBI and Anza.

HDIF's extensive network and partnerships present an opportunity to leverage learning around how the



A healthcare worker records patient information using smartphone technology through Amref's mvaccination programme.

principles are being put into practice. Rather than a simple transfer of ideas, the principles will be most effective if contextualised in response to local culture and norms, the economic and policy environment, and the digital landscape of Tanzania. Through this framework, HDIF seeks to learn what works and what does not, where are the synergies, tensions and contradictions, and what, if anything, is missing from the existing principles. From that learning, HDIF aims to develop a set of lessons and recommendations for the most effective use of, and methods for, scaling digital technology in Tanzania throughout the life of the project.

The case studies presented in this document have been written for the attention of key stakeholders in Tanzania – that is, government, donors, peer agencies and the wider development community, in particular those with an interest in implementing digital development projects.



Interns from DOT's Fusion programme.

HDIF CASE STUDIES AND THE PRINCIPLES FOR DIGITAL DEVELOPMENT

Purpose and methods

This paper focuses on the following three digital principles:

- ▣ Design with the user
- ▣ Understanding the existing ecosystem
- ▣ Be collaborative

These three principles focus on the people and partnerships that are the key components of any development project. They draw attention to the necessity of engaging with a range of clients, users and partners whose engagement and ownership are critical to the long-term success of the project. In addition, these principles emphasise the importance of not operating in silos, but instead identifying the partnerships needed to ensure success at all stages of implementation, from start-up through to close-out and at all levels of engagement.

The learning shared in this paper draws on experiences from AMREF, Camfed, CRS, Digital Opportunity Trust, Shule Direct, and Ubongo Kids – grantees that are capitalizing on innovation to improve access to quality basic services in education, health and WASH. The paper aims to showcase and celebrate examples of best practice, as well as lessons, barriers and challenges drawn from the experiences of HDIF digital innovations.

Current HDIF grantees were not asked to address the Principles for Digital Development in their grant applications, nor have those principles been used to monitor and evaluate how each project is developing. Data has therefore been gathered simultaneously with

informing and educating the grantees on what the principles are and why HDIF thinks they are important. A number of methods were used to collect data including informal interviews, reviewing annual reports and

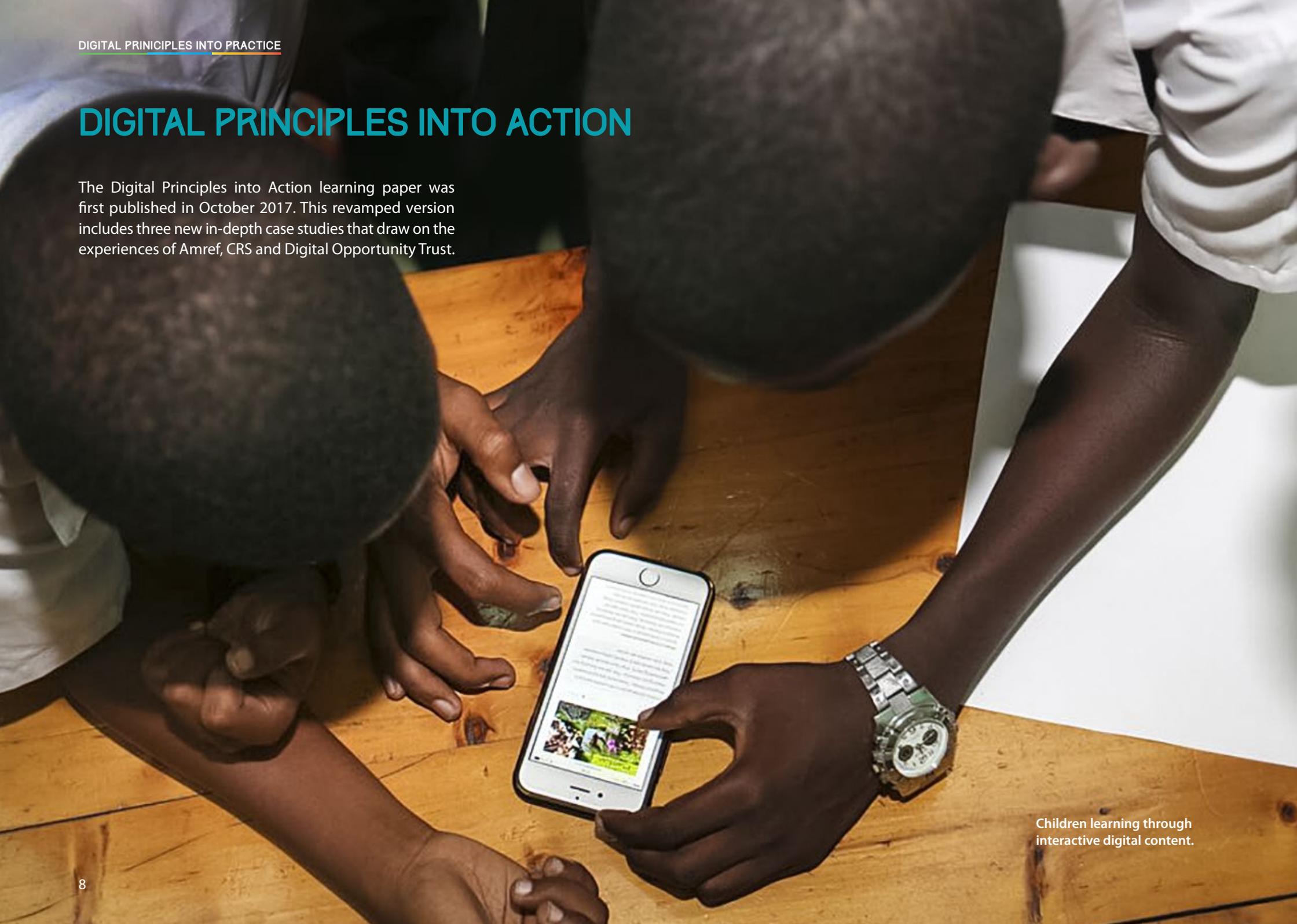
undertaking site visits as well as a survey of grantees to assess their understanding and awareness of the principles. Some text from recent unpublished case studies written by the grantees has also been used.



Camfed is partnering with Worldreader to help girls to transition to secondary school using the latest e-reader technology.

DIGITAL PRINCIPLES INTO ACTION

The Digital Principles into Action learning paper was first published in October 2017. This revamped version includes three new in-depth case studies that draw on the experiences of Amref, CRS and Digital Opportunity Trust.



Children learning through interactive digital content.

Design with the user

- Develop context-appropriate solutions informed by user needs.
- Include all user groups in planning, development, implementation and assessment.
- Develop projects in an incremental and iterative manner.
- Design solutions that learn from and enhance existing workflows, and plan for organisational adaptation.
- Ensure solutions are sensitive to, and useful for, the most marginalised groups: that is, women, children, people with disabilities and those affected by conflict and disaster.

Lesson 1

Designing with the user is an on-going process that begins with the initial design of a digital product or service, and continues through implementation, adaptation and scale-up. This partnership between innovator and user informs the evolution of the innovation including how user needs may change over time and in response to evolving contexts and settings.

Case study Ubongo

Ubongo is a Tanzanian non-profit social enterprise with a mission to create interactive edutainment for children across Africa. In the design phase of their school readiness programme, *Akili and Me*, the producers discovered through user feedback that their original design appealed to adults but was confusing and complex for their actual users – that is, the children. Episodes were re-written and the animations adapted and then tested again. Following a more positive response from the children and parents, Ubongo launched the full production of a 26-episode season of the series. It is currently reaching over two million unique viewers every month in Tanzania through TV and radio. Since its launch, Ubongo staff have constantly been seeking feedback from viewers by communicating with users via phone interviews and focus groups. Facebook has also allowed parents to provide Ubongo with a continuous flow of feedback about how their children were responding and interacting with each new episode. An evaluation of the programme, conducted in partnership with the University of Maryland, has shown that the programme is highly effective for increasing children's school readiness, and has a significant effect on school readiness for both girls and boys aged 3–6 years old; the impact on pre-literacy was not significant. In



Akili and Me is an edutainment cartoon and radio series that helps children aged 3–6 to develop pre-literacy and English language skills.

the second series of the show, the makers are acting on these results, and are turning their attention to improving literacy skills as well as teaching socio-emotional skills and 'early mindset building'.

According to Nisha Ligon, Ubongo CEO, "While this process may seem intense, it has helped us quickly develop highly effective and engaging learning, by having our users guide us to what they need... not what we think they need."

Recommendation 1

Design with the user should be viewed as a process of continuous improvement, where user feedback is contextualised and integrated into the process at every opportunity. Project managers should experiment with user-centred design and embrace user feedback at every stage of the project. Resources are available both online and offline: books, reports, videos, online courses, step-by-step guides and case studies of best practice. New projects do not need to reinvent the wheel, they simply need to change and adapt existing approaches to suit their particular circumstances.

Understand the existing ecosystem

- Participate in networks and communities of like-minded practitioners.
- Align to existing technological, legal and regulatory policies.

Lesson 2

With digital innovations it is important to consider existing policies, regulations and ways of working in order to assess the suitability of a proposed new technology. In Tanzania, these challenges can only be addressed by developing relationships with people in local communities, schools and local, regional and national governments.

Recommendation 2

Digital innovation projects in all sectors need to engage actors in the local innovation ecosystem as well as the sector-based ecosystem. This includes, for example, community members, relevant professionals such as teachers, and local, regional and national stakeholders in government. Relationships built on trust, where innovators and ecosystem partners collaborate, can facilitate the introduction and implementation of innovations and smooth out disruptions along the way.

Case study Revolutionising Remittance Recovery in Water (R3W)

In a country such as Tanzania, where up to 50 per cent of the population lacks access to clean water,¹³ innovations that can improve water infrastructure and provide communities with a reliable source of safe water that leads to better health outcomes, are much in demand.

In most communities, water systems need to generate revenue to sustainably maintain the equipment and to ensure its continuous provision. The Human Development Innovation Fund (HDIF) supports 'Revolutionising Remittance Recovery in Water' (R3W), a project that has introduced a system for the pre-payment of water combined with an effective and accountable water management system. Implemented in Karatu District in Tanzania, the project is implemented by Catholic Relief Services (CRS) and its business partner, Grundfos LIFELINK A/S, together with a local implementing partner, the Diocese of Mbulu Development Department (DMDD).

The system consists of water dispenser units, deep boreholes, a solar pumping system, piping, elevated storage tanks and storage above the water kiosks. Users pre-pay for water by buying credit from the water kiosks or their mobile phones. The credit is loaded onto a smart card, similar to a credit card, which can be used to operate the water dispensers. The kiosks are operated by the local Community Owned Water Supply Organisations (COWSOs) through kiosk operators. The system sends out data to COWSOs about water use and payments, and reports any malfunctions in the system, such as low pressure or flow rates, which need maintenance. COWSO technicians have received training on resolving a diverse set of operation and maintenance issues. Melkiory

Clement, a trained field technician for the Karatu Village Water Supply (KAVIWASU) prepaid system, reported that prior to R3W, if a problem was too complex, it remained untouched. Since the introduction of R3W, however, any challenges that do arise are resolved.

Understanding and influencing the ecosystem, including existing and potential policies, regulations, stakeholders, funding mechanisms, culture, ways of working and value chains (certain processes or activities) around water in Tanzania has been a key element to the project's success. The role of the COWSOs lies at the heart of the local water ecosystem, who are accountable to the Village Level Water Committees who are responsible for ensuring community interests in the water supply are met by the COWSOs, and to the District Level Water Offices that are established by the Ministry of Water. The kiosk operators are new players in the ecosystem who are key to the project because of their strong presence in the communities and accountability to COWSOs. According to the Qaru Village chairperson Richard Dawite, the greatest benefit of the technology has been its transparency and the improved relationships between the COWSO, kiosk operators and community members, as there is now an environment of trust. Community members can see exactly the amount of water they are collecting and how much they are being charged. Fabiano Qadwe, Endallah Village Water Supply (Endawasu) manager agrees: 'Now with the new system, no one thinks someone is stealing their money.'

Throughout the R3W project, CRS has improved relationships between different actors and strengthened

the water management ecosystem by working closely with partners at the local, regional and national level. At the local level, CRS is training COWSO staff and kiosk operators to better manage the system and give the village water committees an effective role in decision-making through their membership on the boards of COWSOs. At the national level, CRS serves on the technical task force group, and shares evidence and learning from the programme that can be used to inform future roll-out and adoption of prepaid water systems.

A major breakthrough since the adoption of the technology is that it has strengthened relationships among community members. With the previous system, people had to wait in long lines, and going to collect water was a burden, especially for women who are primarily responsible for water collection. Now, collecting water is something people enjoy. They meet their neighbours, share pleasant interactions, and even lend their cards to those who do not have one. Women in particular have benefited from the certainty of a reliable and consistently priced water supply, which in turn has reduced water-related conflicts within their families.

The digital innovation around the payment system has simplified the transactions, contributing to higher revenues, which has increased by 250 per cent, and improvements in the overall governance. It has also helped reduce historical tensions between COWSOs and customers who now view the COWSOs more positively and with respect. News of R3W has been shared with neighbouring villages who are now requesting their own pre-payment system.



Marietta and Justina enjoying water services at one of the R3W prepaid water kiosks in Karatu, a CRS project.

Case study Shule Direct

Shule Direct's Makini SMS is a mobile learning platform that provides students and teachers with access to locally designed digital learning resources. With the expanding mobile network, the intervention aims to reach the most marginalised students in the most destitute areas of Tanzania. The innovation hopes to address some of the pertinent problems of under-resourced schools by infusing e-learning and mobile-learning as a supplement to classroom teaching.

Using their extensive understanding of the ecosystem, Shule Direct recognised that many students and teachers have very limited access to the internet and consequently were excluded from online learning. Collaborating with Eneza Education, a Kenyan non-governmental organisation (NGO), Shule Direct adopted the Eneza Education platform and worked with local developers and teachers to design Makini SMS, a mobile-based learning platform contextualised for the Tanzania secondary education service.

This interface allows access via basic mobile phones with limited multimedia and internet capabilities. In order to reach their target market, Shule Direct brought on board Tigo, a major mobile operator with a young customer base. Understanding the importance of government buy-in, Shule Direct has engaged with the Tanzania Institute of Education (TIE) on the development and approval of their mobile content

to ensure the content aligns closely with the government-approved secondary school curriculum. The result of these collaborations is the provision of access to educational resources to approximately 800,000 young people on the web and through the SMS platform.



**Kuanzia sasa
unaweza kumpata
Ticha Kidevu kwenye simu**

Makini SMS Kuwa huru kujifunza

www.shuledirect.co.tz/makini

Shule Direct's Makini SMS can be accessed through a basic feature phone

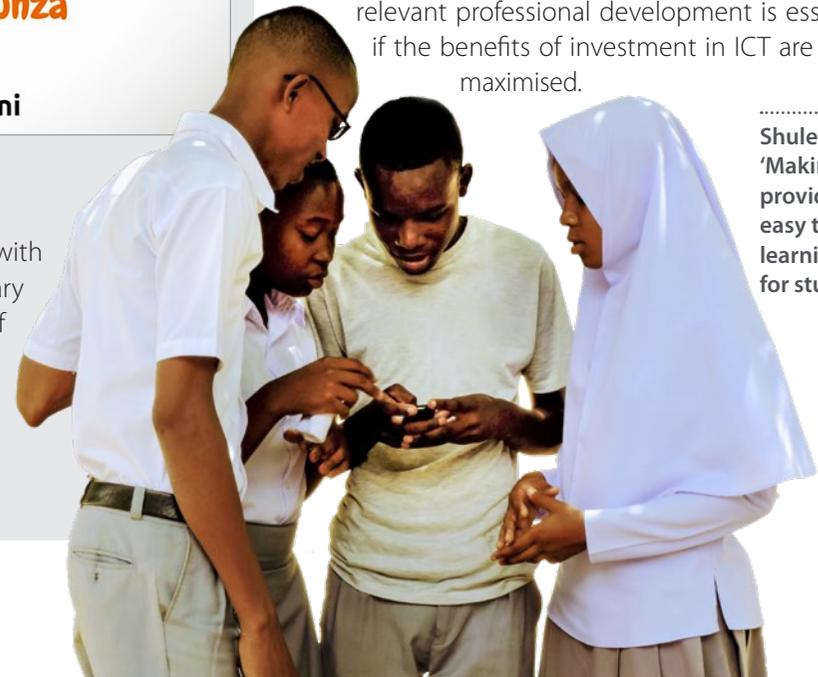
Learning from challenges

In contrast, another grantee, working independently, failed to gauge or understand the ecosystem when implementing their educational concept. They therefore had insufficient understanding of several key ecosystem players and how they work – including community members, landlords, and government officials at ward, district and national levels. This caused delay in school acquisition and registration.

Recommendation 3

Neglecting the fundamental role of the teacher when introducing new technology is common in classrooms around the world. Tanzania is no exception and developing a more in-depth knowledge and understanding of the current role of teachers, key players in the education ecosystem in Tanzania, will be essential if this and future projects are going to have an impact and become sustainable. Teacher training should be continuous, and ongoing relevant professional development is essential if the benefits of investment in ICT are to be maximised.

Shule Direct's 'Makini SMS' provides an easy to access learning resource for students.



Lesson 3

Only by adopting a broader, more inclusive interpretation of the ecosystem as the world in which users live, with complex cultural contexts and social norms, is it possible to provide *everyone* with access to digital innovations that are designed to meet their needs and help them to realise their full potential.

Learning from challenges

There is the potential for specific groups of users – particularly those in marginalised communities – to miss out on the benefits of innovation and for a digital divide to open up that inadvertently excludes the very people the innovation seeks to serve. Equal access to technology or training may be seen as ‘enough’ and the cultural issues hindering progress for women or other marginalised groups may be ignored. One way of addressing this challenge is to understand how interpersonal dynamics and social, cultural and environmental factors can impact an individual’s ability to engage with innovation and how innovation design takes these factors into account.

Well-designed innovations that expand equal learning opportunities for women and men have the potential to build girls’ and women’s skills and self-confidence, and strengthen positive working relationships between female and male students and teachers. These changing dynamics have the potential to realign gender norms and behaviours within educational institutions and the broader ecosystem.



Young students from a Technical and Vocational Education and Training (TVET) Folk Development College celebrate their graduation.

Because digital innovations in education hold this potential for change, it is particularly important to consider existing policies, regulations and ways of working in order to assess the suitability of a proposed new technology or innovation. In Tanzania, these opportunities need to be built through collaborations across schools, communities, and local, regional and national governments.

Recommendation 4

It’s important to recognise that equal access to technology is not the same as equal opportunity, as cultural aspects and attitudes may impact the progress of some groups.

Innovators and project managers should explore the dynamics between different user groups, how they interact with technology and how that might influence the design of a programme.

Recommendation 5

Innovators need to be aware aware of the potential harm that technology can pose for girls and women. Help to address this by exploring, for example, vulnerability posed by having an online presence, and how girls’ and women’s access to and use of technology may be perceived by their families, husbands and other community members.

Case study Digital Opportunity Trust Tanzania (DOT)

DOT has, with Human Development Innovation Fund (HDIF) support, integrated two highly acclaimed programmes into the government's Vocational Education and Training Authority (VETA) colleges. ReachUp! teaches digital, employment and entrepreneurial skills to VETA students and out-of-school youth; university graduates work as ReachUp! interns where they learn leadership, facilitation, mentoring and coaching skills, while supporting students on the programme. TeachUp! supports teachers in five VETA centres and student teachers at the Morogoro VETA Teachers' Training College to integrate technology into their classrooms and curriculum. In addition, DOT engages teacher facilitators, digitally savvy youth who deliver the programme in the VETA centres and coordinate efforts for setting up virtual classrooms for students in tertiary education. So far, DOT has reached 3,500 young people and 200 teachers in Dar es Salaam and Morogoro.

The Tanzanian government has no information and communications technology (ICT) curriculum in schools, and many aspiring young entrepreneurs must pay for courses with money from their own pocket. DOT's programmes seek to strengthen opportunities for students who are already out of school, at risk of failing school, or who lack money to pay for complementary education courses, while increasing their self-esteem and their ability to plan and develop sustainable livelihoods. The programmes challenge students to use innovative thinking and entrepreneurial skills to assess the ways in which they can address problems and expand opportunities in their local environment. With guidance and support, students create business plans to launch their enterprises.

DOT's partnership with VETA – a key actor in the vocational education ecosystem – has played an important role in the delivery and sustainability of the programme. VETA's extensive reach has enabled DOT to roll out its programmes through a national network of colleges that have experienced tutors, and computer labs with some connectivity to the internet. DOT also offers ICT coaching sessions to individual teachers who are often reluctant to participate in group training, to help them integrate ICT into their classrooms and to understand which ICT resources are appropriate for their settings.

Understanding the ecosystem requires an awareness of culture and gender norms, as well as a consideration of the complex lives of girls and women and their unequal access to resources and influence. In playing their part, DOT has developed a gender strategy that ensures equal participation of young women, and includes training and activities that help to build female students' confidence at the same time as building their skills.

Women's full participation in the innovation ecosystem accelerates the possibility for innovations to meet the needs of women, their children and the communities, yet social norms and behaviours concerning how women engage with technology often stand in their way. A study commissioned by HDIF and carried out by Newcastle University (UK) examined whether DOT's inclusive approach had made a difference.

Their findings bring to the surface some underlying attitudes related to gender. For example, some male

respondents believed that girls lack self-confidence because of their 'nature' and don't engage with ICT because their families can't see why they should use computers (focus group discussion with young male students, VETA Kihonda). Respondents from both DOT programmes speculated that young women begin the training with a weaker sense of self-confidence than young men due to less exposure to, and experience with, computers, or because of societal norms towards girls and women using technology. Interviews with women students and teachers also suggested that the lack of confidence related to a persistent stereotype that technology is a male domain.

The study also found that once women overcame their initial fears and started to engage with the technology and demonstrate their ability, their self-confidence grew. As one female student from VETA Kihonda remarked: 'We are absolutely 100 per cent confident. We even help the boys.'

ReachUp! has engendered positive changes in behaviours and attitudes between female and male students who are encouraged to work in mixed groups during classes. Both men and women in the focus groups commented that women's ICT skills are sometimes better than men's, and that all members of the group are willing to help each other. The training has also led to positive repercussions within the homes of some students as experienced by one young woman studying at VETA Morogoro: 'Our families see us as heroes, having learned new skills. My family is very receptive and encouraging me to apply the skills I have acquired.'



Magdalena Maganga,
a DOT intern.

Be collaborative

- Engage diverse expertise across disciplines and industries at all stages.
- Work across sector silos to create coordinated and more holistic approaches.
- Document work, results, processes and best practice, and share them widely.
- Publish materials under a Creative Commons licence by default, with strong rationale if another licensing approach is taken.

Lesson 4

Being collaborative includes the development of partnerships that bring expertise and experience together with the aim of designing and delivering successful development programmes. Sometimes partners are local private or government organisations, sometimes they are international specialists or academic institutions. Implementing partners working in isolation might not only limit the success of their own programme but would certainly reduce the impact of sharing the success stories and challenges with the broader development community.



Secondary school students at Oljoro VETA centre in Arusha learning ICT skills through a programme run by World Vision.

Identifying and engaging the right partners is critical to achieving long-term sustainable change. Each level of partnership will add something unique and requires collaborating in different ways. The Partnering Initiative identifies five levels of partnering: policy, infrastructure, partnerships, organisations and individuals.¹⁴ HDIF grantees are collaborating with multiple partners at different levels in different ways to complement their activities, ensure their sustainability, expand their networks and their reach, and demonstrate impact.

Collaboration examples

Distribution partners: Ubongo Learning collaborates with several partners to distribute its educational content through partners' programmes in order to achieve its aim of bringing edutainment to children across Tanzania. These programmes include fellow grantee Silverleaf, Camara Education, Avanti Satellites, Mobisol and EquipT.

Partnerships on many levels: Camfed is an international education NGO that supports the empowerment of young women. Through the HDIF-funded e-reader literacy programme it has collaborated with other players

in the field at different levels. Camfed is partnering with Worldreader to develop suitable materials for marginalised rural students, with national and district education structures to embed e-readers into the government English orientation programme, and with young women graduates to work as Learner Guides to support the students. The Camfed approach has been especially successful in supporting marginalised girls who have diverse needs and unequal access to resources and influence.

Complementary products: Two HDIF education programmes – Camfed and Fundación Paraguaya – operate together in several secondary schools. Despite having very different objectives, the two programmes complement each other. The improved English oral and written skills from the Camfed programme are transferred and reinforced in the business club activities of Fundación Paraguaya. The result is improved confidence with communication, a better understanding of ICT, and group learning skills that enable students to acquire and put into practice the knowledge, skills and competencies necessary for employment.

Research: A number of grantees have collaborated with research organisations to help deliver rigorous and reliable evidence of what does and what does not work. Ubongo collaborated with the University of Maryland, which carried out comprehensive research on the impact of *Akili and Me*. Fundación Paraguaya is partnering with the University of Minnesota to evaluate the impact of their innovative business club programme in secondary schools in Iringa region. Other projects that are nearing completion have requested similar partnerships, knowing that collaboration with a reputable organisation with academic research experience will give credibility to data used in their reports, especially in the education sector. Projects should also consider collaborating with research organisations to help deliver rigorous and reliable evidence of what works.

Case study Amref Health Africa's mVacciNation project

Although child mortality rates in Tanzania have vastly improved over the past thirty years, health innovations that seek to alleviate stock-outs in childhood vaccines and improve timely, accurate and complete patient information for mothers and their infants remain a simple matter of life and death.

HDIF supports digital products that can bring services and information closer to women and girls, and make maternal and child health information systems possible, thereby improving access to quality basic services for women and their families. With access to mobile phones rapidly increasing in rural Tanzania, many opportunities exist for mobile technology to help health-care providers to save children's lives through adherence to vaccination schedules.

Responding to the challenge, Amref Health Africa have adapted and deployed a mobile health application ('app') called mVacciNation – Boresha Chanjo, a Swahili phrase that roughly translated means 'to improve vaccination coverage'. The app enables health-care practitioners equipped with tablets or smartphones to view and record patient vaccination histories, schedule upcoming appointments, and report on follow-up visits. Using the same app, health facilities are prompted to submit regular reports on vaccination stocks in order to prompt new supply shipments when needed, thus improving reporting between the district, health facilities and the community. New mothers who



Amref's mVacciNation app sends SMS vaccination date reminders to new mothers.

register at a health facility receive automated short message service (SMS) reminders with past and future vaccination dates.

Core to the Amref proposed partnership were GlaxoSmithKline (GSK), Vodafone, Mezzanine and the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC). Each project component, from GSK's prior experience with mVacciNation pilot implementation in Mozambique (in conjunction with Gavi and the United States Agency for International Development, USAID) to Vodafone's Mezzanine mHealth platform, has come together to

reduce morbidity and mortality caused by vaccine-preventable diseases in the Geita and Shinyanga regions. The Mezzanine platform that supports mVacciNation was designed to complement the MoHCDGEC's new Vaccine Inventory System (VIMS) to capture information and deliver immunisations more consistently at the primary-care level.

Early in the mVacciNation roll-out, it was discovered that Vodafone's data coverage in several rural communities was insufficient to transmit patient and stock data from the clinic site into the mVacciNation database. Despite the usual competitive challenges to mobile provider collaboration, the partnership was soon expanded to include Halotel, completing the necessary service area data coverage, and effectively completing the project's proposed reach.

Collaboration from the beginning has been critical to achieving impact. PATH's Better Immunization Data (BID) health initiative is implementing an Electronic Immunization Registry (EIR) that contains child-based immunisation and stock data at the service-delivery level in Tanzania. By sharing patient engagement methods and lessons learned, mVacciNation-Boresha Chanjo and PATH-BID have been working together in ways that benefit the communities they serve. For example, by adopting mVacciNation-Boresha Chanjo's SMS reminder system, PATH-BID is helping to scale up immunisation efforts and raise the number of children being vaccinated throughout Tanzania.

To date, as a result of this collaboration, 100 health service providers have been trained in the use of the mVacciNation system to register over 95,068 children and care-givers, 315,660 immunisations and 17,636 stock updates, and 22,465 temperature updates have been submitted. A total of 30,543 reminder messages have been sent prior to the due vaccination date and 34,412 messages sent out after a missed vaccination appointment. The recent 2016/2017 statistics for Geita and Shinyanga regions show an increase in vaccination coverage from 90 per cent to 98 per cent. Immunisation stock-outs decreased from 78 per cent in 2015 to 28 per cent in 2017, whilst data quality and accuracy increased from 78 per cent in 2015 to 93 per cent in 2017.

As well as defining how the mVacciNation platform can contribute locally, Amref Health Africa is collaborating with others to understand how their work fits within Tanzania's wider health landscape. For example, the project has strongly advocated for the integration of the mVacciNation platform into VIMS to ensure sustainability and replication across all other districts in Tanzania in alignment with the government's National e-Health Strategy (2013–18). In turn, the MoHCDGEC recognises the important role that the mVacciNation app can play in improving the accuracy of health information in Tanzania, allowing for timely assessments of nationwide disease prevalence without the need to conduct time-consuming and expensive site visits. Amref has been encouraged by the MoHCDGEC to scale up the application to all health facilities in Geita and Shinyanga.

PATH: <http://www.path.org>

PATH-BID: <http://bidinitiative.org/bid-at-a-glance/>

Learning from challenges

Looking across the HDIF portfolio, the projects making the least progress are those that operate in silos and fail to develop the necessary partnerships with government, local stakeholders and other partners. There are instances of different education grantees implementing projects with very similar objectives, and failing to realise that they are planning to work in the same institutions; if allowed to implement, there would have been duplication in IT resources, teacher training and teaching programmes. Lack of collaboration and communication can reduce impact and also waste resources.

Recommendation 6

Collaboration across various phases of innovation can facilitate design, implementation, learning and dissemination of results. Innovators and project leaders should seek to build partnerships with local and global people and institutions, as appropriate, to strengthen chances for the innovation to succeed and to inform the broader ecosystem.

Out-of-school youth learning digital skills at the VETA Kipawa Centre in Dar es Salaam through DOT's ReachUp! programme.



dot

NEXT STEPS FOR HDIF

HDIF will continue to gather learning around the other principles and across sectors. The results will be disseminated to stakeholders in Tanzania and globally, through platforms such as DIAL and through HDIF events, its website and social media.

HDIF has identified another priority issue for further exploration through the digital learning agenda. Insights gathered so far suggest that 'inclusion' as a wider concept has been largely missing from the Principles but is increasingly starting to appear in discussions related to the Principles for Digital Development. The impact of digital innovations on women, girls and other marginalised groups is also being explored through HDIF's second learning agenda, which aims to better understand whether innovations are bringing positive impact to women and girls. The first HDIF White Paper on gender (*Making innovation work for girls and women in Tanzania*) can be found at www.hdif.org/gender. HDIF will continue pursuing learning on this topic.

In May 2018, HDIF will award a third cohort of education and WASH innovations. It is HDIF's intention to develop a monitoring and evaluation framework based around the nine Principles that will track and measure how HDIF grantees use and work with the Principles over the project lifecycle. HDIF will share this learning with practitioners, policymakers and funders of innovation to deepen our collective understanding of how best to improve the use, scaling and adoption of digital technology in development in Tanzania.



The office at Shule Direct, a social enterprise that provides digital study tools for Tanzanian secondary school students.

ENDNOTES

- 1 www.gov.uk/government/uploads/system/uploads/attachment_data/file/575935/DFID-digital-guidance-partners-suppliers-v8a.pdf
- 2 International Telecommunication Union: ICT facts and figures 2015, www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf
- 3 <http://documents.worldbank.org/curated/en/896971468194972881/pdf/102725-PUB-Replacement-PUBLIC.pdf>
- 4 Global Sustainable Development Report 2016 <https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=2328&menu=1515>
- 5 <https://ideas.repec.org/a/eee/telpol/v23y1999i1p35-50.html>
- 6 <http://documents.worldbank.org/curated/%20en/896971468194972881/pdf/102725-PUB-Replacement-PUBLIC.pdf>
- 7 <http://digitalprinciples.org/>
- 8 <https://www.gov.uk/government/publications/dfid-digital-strategy-2018-to-2020-doing-development-in-a-digital-world>
- 9 www.ictc.go.tz/about-ict/functions-and-mandates.html
- 10 Tanzania Communications Regulatory Authority <https://www.tcra.go.tz/>
- 11 www.innovate.co.tz
- 12 For more details on HDIF's portfolio, see www.hdif-tz.org/portfolio
- 13 WHO-UNICEF Joint Monitoring Programme www.unwater.org/new-publication-whounicef-joint-monitoring-programme-2017-report
- 14 <https://thepartneringinitiative.org/>

(All links accessed 25 April 2018)



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